18. Jan 2019

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554
VIA ELECTRONIC DELIVERY

RE: Public Notice DA-18-1231, ET Docket 13-49
Office of engineering and technology and wireless telecommunications bureau seek comment on 5GAA petition for waiver to allow deployment of cellular vehicle-to-everything (C-V2X) technology in the 5.9 GHz band

Dear Ms. Dortch:

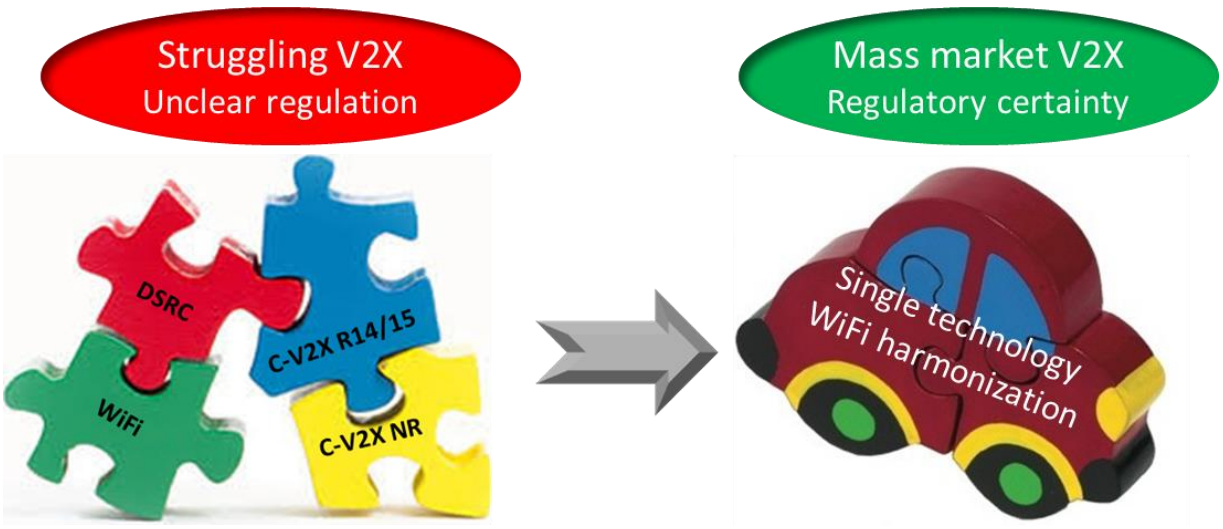
1. Introduction

Autotalks is a leading international designer/manufacturer of connected car technologies. For over a decade, Autotalks developed Automotive-grade chipsets for Dedicated Short Range Communications (DSRC) technology, awarded for mass market deployment. Recently, Autotalks implemented C-V2X, offering configurable dual-mode DSRC/C-V2X operation.

Autotalks believes that **a single technology should be selected for safety services, either DSRC or C-V2X**. Both V2X technologies, DSRC and C-V2X, are meeting V2X requirements, but there is no room for two non-interoperable technologies in a single geography.

In addition, **Autotalks urges FCC to complete planning of the entire 5.9GHz spectrum at once**, and to describe how U-NII-4 WiFi, DSRC or C-V2X are using the spectrum. Overall V2X spectrum plan should be defined including considerations for future revisions (802.11bd as DSRC successor and C-V2X NR). Multiple partial decisions can lead to incompatibilities and inconsistencies.

Given Toyota's and GM's announced DSRC deployments in 2021 and 2023, and other OEMs unannounced activities, **regulatory uncertainties should be urgently eliminated**. Large-scale V2X deployment has the potential to improve safety on US roads, and should not be delayed.



2. Single V2X technology is a condition for V2X deployment

a. V2X benefits can be achieved only if all vehicles are speaking the same language

An accident can be prevented by V2X only if vehicles can understand each other. Two vehicles with V2X will not be able to avoid a potential accident if two different non-interoperable technologies are used.

b. Using two-technologies for a single service is spectrum inefficient

Even with full 70MHz band allocated for V2X, dual-technology usage would limit the bandwidth of each technology to 30MHz/40Mhz, thus preventing advanced V2X use-cases.

While Autotalks strongly opposes to WiFi U-NII-4 re-channelization sharing suggestion, which effectively shrinks the V2X spectrum to 30MHz, it is still considered by FCC. Spending the remaining 30MHz spectrum just for sending the same safety messages in two different languages is a waste.

c. OEMs deployment depend on regulatory certainty

At this time, V2X deployments are voluntary. In a climate of regulatory uncertainty, OEMs will be hesitant to deploy, and infrastructure deployments would stop.

d. Using two-technologies for a single service is cost deficient

Dual-technology deployment will approximately double V2X cost. It cannot be expected that OEMs would bear the costs. Only few end-customers are willing to purchase V2X voluntarily because the value of V2X in early market with low penetration is limited. The number of potential customers would drop once cost increases.

e. Concurrent dual-technology operation would push V2X deployments by several years

OEMs and Tier1s have production grade DSRC platforms, and evaluation C-V2X platforms. But no OEM or Tier1 has a platform that supports concurrent DSRC / C-V2X operation. Mutual interference is expected. That would require further development of security processing scaling, efficient RF sub-system, interference mitigation and more, pushing away V2X deployment by several years.

f. Other geographies selected a single technology

China adopted C-V2X heading toward nationwide deployment in new vehicles and infrastructure. Chinese government plans that 50% of new vehicles will install V2X by 2021, ramping to 100% in 2025.

The European Commission published a regulation[1] (called “Delegated Act”) calling for DSRC usage (ITS-G5 in European terminology). The act explains the need for a regulatory framework defining a single language in all vehicles. A new technology can be introduced only in backward compatible and interoperable manner if proven to be mature, and at this time the Commission doesn’t see C-V2X as mature. The largest European OEM, Volkswagen, will mass deploy DSRC from 2019, and more OEMs are expected to follow as a result of the Delegated Act publication.

g. Both DSRC and C-V2X satisfy V2X requirements

As a developer of both technologies, Autotalks is well familiar with the strengths, weaknesses and usability of DSRC and C-V2X. The performance of the two technologies is roughly equivalent, with some advantages and disadvantages for each. Both technologies can serve all V2X requirements.

h. Future services may later decide to use a different single technology

V2X starts with basic awareness service. Soon after, V2X will support more advanced services such as cooperative perception (sensor sharing), cooperative maneuvering (automated driving assistance) and pedestrian safety. Same single technology should be used for those future services, but the technology might change to a different single technology if justified and cross-technologies interferences are mitigated.

[1] https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-2592333_en

3. Full 5.9GHz spectrum allocation should be planned at once

a. Single spectrum decision is needed

Phased decisions, one for C-V2X Rel. 14/15, second for C-V2X NR, and third for WiFi sharing, have the potential to create misalignment and contradictions. A single decision is needed for creating a regulatory certainty.

Having said that, spectrum may be re-allocated if justified for future V2X services, while maintaining backward compatibility and interoperability with existing V2X safety services.

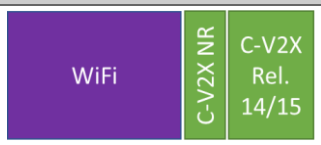
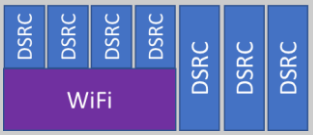
b. U-NII-4 WiFi has a big impact on V2X spectrum availability and usability

FCC is reviewing potential sharing solutions between proposed WiFi and DSRC for enabling U-NII-4 band. FCC defined multi-phased test procedure in ET Docket No. 13-49. The outcome of this activity will directly impact the availability of spectrum for V2X and its usability.

FCC released phase I of WiFi sharing test report after two years of testing. Many comments have urged FCC to continue and complete test phases II and III. Sharing of WiFi and C-V2X would require conducting similar tests.

c. Possible spectrum allocations

Applying the principle of single technology, Autotalks believes that only the allocation options below are applicable:

U-NII-4 policy	Spectrum when DSRC is used	Spectrum when C-V2X is used	Comments
Not sharing with V2X			1. Bandwidth allocation of 50MHz is unlikely for C-V2X NR 2. IEEE802.11bd is backward compatible with DSRC, and doesn't require a dedicated allocation
Re-channelization			C-V2X can't operate in same channel with WiFi. FCC WiFi sharing phase I test report raises doubts about DSRC as well. Overall V2X bandwidth would be limited to 30MHz.
Detect & Vacate			Detect & vacate is likely to enable DSRC sharing with WiFi. C-V2X detect & vacate is less likely due to high cost burden on U-NII-4 WiFi devices.

Yours sincerely
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